

Project

Cornwall FLOW Accelerator

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Context

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Floating Offshore Wind (FLOW) has the potential to deliver 10GW of Britain's target of 50GW of offshore wind capacity by 2050. FLOW has the capability to deliver renewable energy at unprecedented scale and the potential FLOW market is at least twice the size of fixed offshore wind, with Cornwall identified as one of the two best regions in the UK for FLOW deployment.

However, to unlock this opportunity there is a strong case for targeted public sector intervention. There are critical and significant market failures and barriers to innovation in development, installation, foundations and O&M. The main market failures relate to: -

* The lack of coordination between players in the value chain to share essential performance information

* Insufficient investment by industry due to high uncertainty of demand
* The aversion of developers to including innovation in their farms, due to the increased cost.

The rate at which offshore wind is deployed off the UK coast depends largely on how successful innovation is at reducing costs. Significant private sector investment in innovation, catalysed by public sector support to remove barriers and market failures, is needed to unlock the opportunities presented.

Market Failure Assessment

The fundamental aim is supporting businesses operating in key marine technology areas to develop and exploit opportunities that will make a difference to their current operating processes, onshore and offshore services, addressing market failures which are multiple, significant and demand prompt action. e.g. Market Failure 1 (M1) Productivity is carbon intensive - developments required to production processes through improvements in factory operations, scheduling of raw materials, components and supply chain activities (e.g. UKAR) to gain a wide speed data within the offshore environment, to inform the planning of floating wind array placement, requiring new technology, collaborative systems to achieve technological shifts through e.g. collection of data and AI technologies. M3 Lack of accurate wind resource data across the Celtic Sea addressed through procurement of upstream and downstream floating Light Detection and Ranging (LiDAR) to gather wind speed data within the offshore environment, allowing better performance in the complex marine environment. M4 employing floating wind array planning, design, manufacturing deployment maintenance and decommissioning addressed through simulation of the physical properties of the onshore and offshore environment, including manufacturing techniques, installation and support infrastructure, and the use of floating wind turbines. M5 installation, commissioning and operation to encourage market growth, and creating a point of access within the region (e.g. in offshore floating wind). M5 Asynchronous public welfare challenge which needs to align skills and employment factors to business prosperity by ensuring that businesses can access the best people to lead and higher. M6 Social and economic growth leading to societal loss and higher marginal social costs. Asymmetric information between CIOs businesses and counterparts elsewhere because of remoteness to market. Cornwall Low Carbon Flow helps promote low carbon R&D at scale, overcomes barriers to commercialisation of new products, challenges risk, supports supply chain development, defining new green and blue market sector opportunities, helping businesses to access the floating offshore market, promoting innovation and helping businesses engage in innovation in order to:

- (1) derive business advantage, competitiveness and improve productivity from innovation contributing to increased business activity.
- (2) strengthen business resilience and improve ability in response to changing market scenarios and the ability to stimulate and access new markets.
- (3) help SMEs contribute to CIOs' long-term sustainable development, addressing technical, and environmental considerations.

Cornwall Low Carbon FLOW will address the contributors to market failure through business support, collaboration & co-creation of business models, with the resultant actions leading to (i) better and more local jobs, (ii) better performance in the offshore environment, (iii) financially more resilient companies (iv) companies leading to productivity improvements which address market opportunities (v) reduction in greenhouse gases.

Project Objectives

Offshore Project Development – undertake offshore resource and environmental analysis, including the deployment of 2 LIDAR/ADCP buoys in Celtic Sea FLOW Zone 1, as a first key step on the development of a large-scale FLOW project pipeline for the Celtic Sea FLOW Accelerator – design and build a LIDAR simulator for offshore operations, marine operators modelling, mariner and engineer training

Low Carbon Footprint Operations – undertake low carbon footprint operations and engineering analysis, procurement, construction and installation (EPCI) capability analysis to: meet BEI OWSD target of 60% local content; establish EPCI carbon baseline; design Supply Chain Plan frameworks

Rationale

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Project partners will support the private sector, removing barriers to innovation investment & accelerating development in this new growth sector

Inputs

What	Value
ERDF	£5,079,070
Match Funding	£1,269,771

Intended Impacts

What
Acceleration of FLOW market creation through Zonal Integrated Planning Leasing & Offshore Consenting (ZIPLOC);

Creation of a virtual offshore learning environment to accelerate technology development and a reduction in FLOW levelised cost of energy (LCOE)

Development of capacity to drive significant reductions in GHG emissions from offshore operations and to reduce offshore installation and O&M costs, thus accelerating LCOE reductions, through Low Carbon Footprint operations

Creation of a regional Low Carbon Footprint FLOW Supply Chain

Outcomes

ID	Intended Outcome	How is it Measured?	Level	Baseline	Actual
1	Delivery of 18 months of LIDAR/ADCP data in Celtic Sea Zone 1	2 x 18 month full offshore wind resource and MetOcean data sets from Zone 1 West & East deployments using ZIPLC methodology	Project	no data sets exist	2 data sets will exist from Zone 1
2	Delivery of a FLOW simulator, as a virtual learning environment for FLOW at the project and technology levels, and for offshore training	Existence of a fully functioning multi-level FLOW simulator	Project	No FLOW simulation capability exists anywhere in the world	A fully functioning FLOW simulator will exist and be working on hub-and-spoke basis between the ORE Business School and the UOE and UOP campuses
3	Development of a Low Carbon Footprint analysis capability, accessible to local FLOW project and technology developers, and to the offshore supply chain	Existence of a fully functioning multi-level Low Carbon Footprint analysis tool	Project	No Low Carbon Footprint analysis capability for FLOW operations exists anywhere in the world	A fully functioning Low Carbon Footprint Analysis tool will exist
4	Development of a Low Carbon Footprint assessment programme and Regional Supply Chain database	Existence of an assessment programme and a supply chain data base	Project	No FLOW supply chain companies currently have a Low Carbon Footprint capability	10 local companies will have completed Low Carbon Footprint assessments
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Outputs

What	Value
Number of enterprises receiving support	56
Number of new enterprises supported	3
Number of enterprises cooperating with research entities	24
Number of enterprises supported to introduce new to the firm products	8
Estimated annual decreases of greenhouse gases	5642 kg

Activities

What LIDAR Validation for Low Carbon Investment
Low Carbon Offshore EIA Strategies
Innovation in Low Carbon Design & Manufacturability
Low Carbon Offshore Installation, Operation & Maintenance Processes
Low Carbon FLOW Simulator Data Platform
Low Carbon FLOW Simulator Development